

WHAT IS CLAIMED IS:

1. A method comprising:
synchronizing a first device and a second device, wherein:
compensating for synchronization errors, if the first device and the second device
both initiate said synchronizing at substantially the same time.
2. The method of claim 1, wherein the first device and the second device are
wireless devices.
3. The method of claim 2, wherein:
the first device is a user equipment device; and
the second device is a universal mobile telecommunications system terrestrial access
network device.
4. The method of claim 1, wherein said compensating for synchronization errors
comprises canceling a second initial synchronization message, if:
the first device prepares a first initial synchronization message for transmission to the
second device;
the first device transmits the first initial synchronization message;
the second device prepares the second initial synchronization message for
transmission to the first device; and

the second device receives the first initial synchronization message prior to transmitting the second initial synchronization message to the first device.

5. The method of claim 4, wherein the first initial synchronization comprises first uplink information.

6. The method of claim 5, wherein the uplink information comprises an uplink hyper frame number of the first device.

7. The method of claim 4, wherein the first initial synchronization message and the second initial synchronization message are RESET PDUs.

8. The method of claim 1, wherein said compensating for synchronization errors comprises:

incrementing upload information and download information in the first device and the second device only if:

the first device sends a first initial synchronization message to the second device, wherein the first initial synchronization message comprises the upload information, and the second device is set to the upload information;

the second device sends a second initial synchronization message to the first device prior to receiving the first initial synchronization message, wherein the second initial

synchronization message comprises the download information, and the first device is set to the download information;

the second device sends a first acknowledgment synchronization message to the first device in response the first initial synchronization message, wherein the first acknowledgement message comprises the download information, and the first device is set to the download information; and

the second device sends a first acknowledgment synchronization message to the first device in response the first initial synchronization message, wherein the first acknowledgement message comprises the download information, and the first device is set to the download information.

9. The apparatus of claim 8, wherein incrementing upload information and download information in the first device and the second device is incrementing upload information and download information in the first device and the second device by 1.

10. The method of claim 8, wherein at least one of:
the uplink information comprises an uplink hyper frame number of the first device;
and
the downlink information comprises a downlink hyper frame number of the second device.

11. The method of claim 8, wherein at least one of:

the first initial synchronization message and the second initial synchronization message are RESET PDUs; and

the first acknowledge synchronization message and the second acknowledge synchronization are RESET ACK PDUs.

12. The method of claim 1, wherein said compensating for synchronization errors comprises:

incrementing only the upload information in the second device and incrementing only the downlink information in the first device only if:

the first device sends a first initial synchronization message to the second device, wherein the first initial synchronization message comprises the upload information, and the second device is set to the upload information;

the second device sends a second initial synchronization message to the first device prior to receiving the first initial synchronization message, wherein the second initial synchronization message comprises the download information, and the first device is set to the download information;

the second device sends a first acknowledgment synchronization message to the first device in response the first initial synchronization message, wherein the first acknowledgement message comprises the download information, and both the uplink information and the downlink information set in the second device are incremented; and

the first device sends a second acknowledgment synchronization message to the second device in response the second initial synchronization message, wherein the second

acknowledgement message comprises the upload information, and both the uplink information and the downlink information set in the first device are incremented;

the first device is set to the download information upon receipt of the first acknowledgment synchronization message; and

the second device is set to the uplink information upon receipt of the second acknowledgment synchronization message.

13. The apparatus of claim 12, wherein incrementing upload information or incrementing the download information is incrementing the upload information or incrementing the download information by 1.

14. The method of claim 12, wherein at least one of:
the uplink information comprises an uplink hyper frame number of the first device;
and
the downlink information comprises a downlink hyper frame number of the second device.

15. The method of claim 12, wherein at least one of:
the first initial synchronization message and the second initial synchronization message are RESET PDUs; and
the first acknowledge synchronization message and the second acknowledge synchronization are RESET ACK PDUs.

16. The method of claim 1, wherein said compensating for synchronization errors comprises:

incrementing only the upload information in the second device and incrementing only the downlink information in the first device only if:

the first device sends a first initial synchronization message to the second device, wherein the first initial synchronization message comprises the upload information, and the second device is set to the upload information;

the second device sends a second initial synchronization message to the first device prior to receiving the first initial synchronization message, wherein the second initial synchronization message comprises the download information, and the first device is set to the download information;

both the uplink information and the downlink information set in the second device are incremented, the second device sends a first acknowledgment synchronization message to the first device in response the first initial synchronization message, and wherein the first acknowledgement message comprises the incremented download information set in the second device; and

both the uplink information and the downlink information set in the first device are incremented, the first device sends a second acknowledgment synchronization message to the second device in response the second initial synchronization message, wherein the second acknowledgement message comprises the incremented upload information set in the first device, and;

the first device is set to the download information upon receipt of the first acknowledgment synchronization message; and

the second device is set to the uplink information upon receipt of the second acknowledgment synchronization message.

17. The apparatus of claim 16, wherein incrementing upload information or incrementing the download information is incrementing the upload information or incrementing the download information by 1.

18. The method of claim 16, wherein at least one of:
the uplink information comprises an uplink hyper frame number of the first device;
and
the downlink information comprises a downlink hyper frame number of the second device.

19. The method of claim 16, wherein at least one of:
the first initial synchronization message and the second initial synchronization message are RESET PDUs; and
the first acknowledge synchronization message and the second acknowledge synchronization are RESET ACK PDUs.

20. A system configured to implement the method of claim 1.

21. A system comprising:
a first device;
a second device; and
a means for compensating for synchronization errors during synchronization of the first device and the second device, if the first device and the second device both initiate said synchronizing at substantially the same time.

22. A failsafe radio link control (RLC) reset method between two RLC peer entities, comprising:
independently determining at both of the two RLC peer entities whether or not a RLC reset is required between the two RLC peer entities;
independently initiating, at substantially the same time, a RLC reset procedure at each of the two RLC entities if it is determined that a RLC reset is required; and
synchronizing the two RLC peer entities without failure.

23. The failsafe RLC reset method of claim 22, wherein each of the two RLC peer entities has a pair of hyper frame numbers (HFNs).

24. The failsafe RLC reset method of claim 23, wherein initiating a RLC reset procedure at each of the two RLC entities includes:
transmitting from a first RLC peer entity of the two RLC entities, a first RESET PDU with a first RLC side first HFN;

canceling at a second RLC peer entity of the two RLC entities, transmission of a second RESET PDU when the second RLC peer entity receives the first RESET PDU before transmitting the second RESET PDU.

25. The failsafe RLC reset method of claim 24, wherein synchronizing the two RLC peer entities:

setting at the second RLC peer entity, a second RLC side first HFN to a value equal to the first RLC side first HFN contained in the first RESET PDU upon reception of the first RESET PDU;

transmitting from the second RLC peer entity, an RESET ACK PDU with a second RLC side second HFN in response to the first RESET PDU;

increasing by 1 the second RLC side first HFN and a second RLC side second HFN of the second RLC peer entity;

setting at the first RLC peer entity, a first RLC side second HFN to a value equal to the second RLC side second HFN contained in the RESET ACK PDU upon receipt of the RESET ACK PDU.

26. The failsafe RLC reset method of claim 23, wherein initiating a RLC reset procedure at each of the two RLC entities includes:

transmitting from a first RLC peer entity of the two RLC entities a first RESET PDU with a first RLC side first HFN; and

transmitting from a second RLC peer entity, a second RESET PDU with a second RLC side second HFN before receiving the first RESET PDU.

27. The failsafe RLC reset method of claim 26, wherein synchronizing the two RLC peer entities includes:

setting at the second RLC peer entity, a second RLC side first HFN to a value equal to the first RLC side first HFN contained in the first RESET PDU upon receipt of the first RESET PDU;

transmitting from the second RLC peer entity, a first RESET ACK PDU with a second RLC side second HFN in response to the first RESET PDU;

setting at the first RLC peer entity, a first RLC side second HFN to a value equal to the second RLC side second HFN contained in the second RESET PDU upon receipt of the second RESET PDU;

transmitting from the first RLC peer entity, a second RESET ACK PDU with the first RLC side first HFN in response to the second RESET PDU;

setting at the first RLC peer entity, the first RLC side second HFN to a value equal to the second RLC side second HFN contained in the first RESET ACK PDU upon receipt of the first RESET ACK PDU ;

increasing by 1 the first RLC side first HFN and first RLC side second HFN of the first RLC peer entity;

setting at the second RLC peer entity, the second RLC side first HFN to a value equal to the first RLC side first HFN contained in the second RESET ACK PDU upon receipt of the second RESET ACK PDU; and

increasing by 1 the second RLC side first HFN and the second RLC side second HFN respectively at the second RLC peer entity.

28. The failsafe RLC reset method of claim 26, wherein synchronizing the two RLC peer entities includes:

setting at the second RLC peer entity, a second RLC side first HFN to a value equal to the first RLC side first HFN contained in the first RESET PDU upon receipt of the first RESET PDU;

transmitting from the second RLC peer entity, a first RESET ACK PDU with a second RLC side second HFN in response to the first RESET PDU;

increasing by 1 the second RLC side first HFN and the second RLC side second HFN respectively at the second RLC peer entity;

setting at the first RLC peer entity, a first RLC side second HFN to a value equal to the second RLC side second HFN contained in the second RESET PDU upon receipt of the second RESET PDU;

transmitting from the first RLC peer entity, a second RESET ACK PDU with a first RLC side first HFN in response to the second RESET PDU;

increasing by 1 the first RLC side first HFN and the first RLC side second HFN at the first RLC peer entity;

setting at the first RLC peer entity, a first RLC side second HFN to a value equal to the second RLC side second HFN contained in the first RESET ACK PDU upon receipt of the first RESET ACK PDU;

increasing by 1 only the first RLC side second HFN at the first RLC peer entity;

setting at the second RLC peer entity, the second RLC side first HFN to a value equal to the first RLC side first HFN contained in the second RESET ACK PDU upon receipt of the second RESET ACK PDU; and

increasing by 1 only the second RLC side first HFN at the second RLC peer entity.

29. The failsafe RLC reset method of claim 26, wherein synchronizing the two RLC peer entities includes:

setting at the second RLC peer entity, a second RLC side first HFN to a value equal to the first RLC side first HFN contained in the first RESET PDU upon receipt of the first RESET PDU;

increasing by 1 the second RLC side first HFN and a second RLC side second HFN at the second RLC peer entity;

transmitting from the second RLC peer entity, a first RESET ACK PDU with a second RLC side second HFN in response to the first RESET PDU;

setting at the first RLC peer entity, a first RLC side second HFN to a value equal to the second RLC side second HFN contained in the second RESET PDU upon receipt of the second RESET PDU;

increasing by 1 the first RLC side first HFN and the first RLC side second HFN at the first RLC peer entity;

transmitting from the first RLC peer entity, a second RESET ACK PDU with the first RLC side first HFN in response to the second RESET PDU;

setting at the first RLC peer entity, the first RLC side second HFN to a value equal to the second RLC side second HFN contained in the first RESET ACK PDU upon receipt of the first RESET ACK PDU;

increasing by 1 the first RLC side first HFN and the first RLC side second HFN respectively at the first RLC peer entity;

setting at the second RLC peer entity, the second RLC side first HFN to a value equal to the first RLC side first HFN contained in the second RESET ACK PDU upon receipt of the second RESET ACK PDU; and

increasing by 1 the second RLC side first HFN and the second RLC side second HFN at the second RLC peer entity.